REMARKS

Claims 1-24 will be pending in this application after the Examiner enters the forgoing amendment.

The Examiner rejected claims 1-10 and 12-20 under 35 U.S.C. § 103 as allegedly being unpatentable over U.S. Patent Application Publication 2003/0171142 to Kaji et al. in view of U.S. Patent 6,047,085 to Sato et al.; rejected claim 11 under § 103 as being unpatentable over Kaji in view of U.S. Patent Pub. No. 2002/0028710 to Ishihara et al.; rejected claim 4 under § 103 as being unpatentable over Kaji and Sato further in view of U.S. Patent No. 7,006,693 to Shibuya; and rejected claim 16 under § 103 as being unpatentable over Shimura in view of Sato.

Applicant has amended claims 1-20[1] and added claims 21-24.

Applicant submits that the pending claims, as amended, are nonobvious in view of the art of record, and otherwise comply with the statutes and regulations.

Support, not limitation, for new claim 21's recitation of a "card insertion slot" may be found, for example, in Figs. 1, 3, and 4 showing card insertion slot (part) 28, and page 13, lines 19-21 of Applicant's Specification translation filed July 19, 2005, disclosing that "a clearance is created between a bottom surface of the cover 26 and the top surface of the housing 24, which constitutes a card insertion part 28"; page 15, lines 13-15, disclosing that a "transparent resin board 56 is fitted into the ceiling of the upper housing 24a and also below the cover 26, and the card 30 (Figure 2) inserted through the card insertion part 28 (Figure 3) is placed on the resin board"; page 29, line 5, disclosing "card insertion slot"; and page 30, line 11, disclosing "card insertion slot". Of course, claim 21 is not limited to the parts described in the above cited sections of the specification.

Support, not limitation, for amended claim 1's recitation of "the card photographing part including an area having a dimension equal to the first dimension, a first structure

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1. Incidentally, Applicant has eliminated or avoided the redundant term "at least" because, in U.S. practice, an article ("a", "an") normally encompasses one and or more than one, a counted element normally encompasses either the number counted or more than the number, and a part normally encompasses the part as well as the whole.

opposing a first side of the area, a second structure opposing a second side of the area, the second side being opposite the first side, the first and second structures acting to fix the card in contact with the area" may be found, for example, in Fig. 4, showing transparent resin board 56 having a width sufficient to accommodate card 30, a wall at the left of resin board 56 and an opposite wall at the right of resin board 56. Of course, claim 1 is not limited to the parts described in the above cited sections of the specification.

Kaji discloses a card game device, card data reader, card game control method, recording medium, program, and card. A game player purchases, for example, eleven player cards on each of which, a soccer player's photograph is printed. When the game player arranges the player cards on a player card arrangement panel of one of the terminal apparatuses, card data recorded on the back of the player card will be read by an internal image sensor. The game player can direct a player's position and formation by changing placement of the player card. Kaji Abstract.

The card game apparatus 10 provides a soccer game in this embodiment, however, it can also provide other team games such as baseball, rugby, American football, and hockey. Kaji paragraph 146.

On the surface of each of the player cards 20, a photograph of different players is printed as described later, and on the back side, a data pattern (identification code) is recorded, which is for identifying the individual player printed on the surface. Kaji paragraph 148.

As shown in FIG. 9, a black-and-white printed pattern that is visible with invisible light is recorded on the back of the player card 20 as a record area of the card data 112. When the invisible light from the luminous source 82 is irradiated on the back of the player card 20, only the invisible light irradiated to the white part, excepting the black part, of the card data 112 is reflected, and input to the image sensor 56, and the pattern of the card data 112 is photographed. Kaji paragraph 177.

Here, the card data 112 provides a memory domain 112d that is in a square shape defined by black frames 112a-112c on three sides, excepting top, namely, the left-hand side, the right-hand side, and the bottom, wherein each of a black part 112e and a white

part 112f formed in the square represent one bit, and a black-and-white pattern configured by, for example, 8 bits in the vertical direction and 3 bits in the horizontal direction is printed such that it is detected. Kaji paragraph 178.

Sato discloses an apparatus and method for identifying the color image of an object. The object's image is digitized and a cut-off portion of the image containing the object is determined. The cut-off portion image data is normalized. Selected pixels of the normalized image are subjected to an averaging process to provide an averaged image containing R, G, and B color components. H, V, and C components of the averaged image data are computed, and their V, c, and d components are computed from the H, V, and C components. A color feature extractor computes from the c and d component data a parameter representative of the object to be identified. This parameter is provided to a memory controller to retrieve from a memory that stores target images one or more images categorized according to the computed parameter. A matching section matches each retrieved target image with the Vcd component data and determines which target image is most similar. Sato Abstract.

The Sato invention relates in general to image identifying apparatus and, more particularly, to image identifying apparatus capable of identifying color images and patterns with precision and speed. Sato col. 1, lines 4-7.

In conventional color image identifying methods, such as a identifying method which compares a frequency distribution pattern of a color image with reference patterns or an identifying method in which a color pattern is averaged and compared with standard patterns, it is necessary to make a comparison with all of the available registered standard patterns. Therefore, substantial time is required for making the comparison if there are a substantial number of standard patterns, so that it is difficult to make an identification at high speed. Sato col. 1, lines 22-31.

Accordingly, the Sato invention is directed to an image identifying apparatus that substantially obviates one or more of the problems due to limitations and disadvantages of the related art. Sato col. 1, lines 34-37.

A color image of the object P (FIG. 1), such as scene image 202 to be identified and a portion of the overall image 200 within which the object P is included, is imaged by

TV camera 102, which provides an analog image signal of the color image to color image input section 104. Sato col. 4, lines 17-21.

In the image averaging section 112, the RGB image normalized in normalizing converter 110 and stored in buffers 1006, 1008 and 1010 is converted into an RGB image having a shaded pixel averaged construction. More particularly, FIG. 11 illustrates the selection of 70 sample pixels, numbered 1-70 among the pixels for which data is stored in buffers 1006, 1008, and 1010. A weighted neighborhood average pixel value will be computed for the sample pixels. FIG. 12 illustrates an exemplary neighborhood of 5x5 pixels for one of the 70 sample pixels and the weighing factors applied to the values of the pixels in the neighborhood. The result of this averaging process is to compute the pixel value of an averaged image of 7 horizontal pixels and 10 vertical pixels consisting only of the computed weighted neighborhood average values of the 70 sample pixels. Sato col. 6, lines 1-16.

At this time, although the areas outside the image sample data provided by normalizing converter 110 are included in the range for averaging, data for peripheral pixels at the periphery of the image area in FIG. 11 are calculated using a pixel value "0" for the areas outside the image area. Also, for each of the 70 sample pixels, after a total weighted sum of the pixels in the 5x5 neighborhood is computed, the sum is divided by 18, which is the sum of the weighing factors shown in FIG. 12. FIG. 13 illustrates the averaged image data resulting from this averaging process for the sample pixel values shown in FIG. 8. The averaged image data is computed for the image data stored in section 110 for each of the RGB colors. Sato col. 6, lines 17-28.

In contrast, each of claims 1-11, 13-15, and 21 recites, inter alia, an entertainment apparatus using cards for obtaining inputs from a plurality of cards, the apparatus comprising a card identifier for searching the database for a specific comparison data array based on the photographic pixel data array and obtaining a card ID pairing up with the specific comparison data array, wherein the photographic pixel data array former sequentially extracts a predetermined number of pixel data of pixels adjacent to each other in an image represented by the photographic signal from the plurality of pixel data constituting the data array while the extracted pixel data are changed sequentially, and

produces the single photographic pixel data based upon the extracted predetermined number of pixel data every time the predetermined number of pixel data is extracted. (Base claim 1). No reasonable combination of the art of record, including Kaji and Sato, would have suggested claim 1's combination of the recited card identifier interrelated with the recited pixel data array former that produces the single photographic pixel data based on the extracted predetermined number of pixel data.

First, there would have been no motivation to Kaji and Sato to suggest claim 1. For this reason alone, there can be no proper rejection under § 103.

More specifically, Kaji discloses a data pattern on a card for identifying a game player, the data pattern encoding, for example, 24 bits[2] Sato discloses an apparatus "capable of identifying color images and patterns with precision and speed",[3] the image being, for example, a landscape scene.[4] The combined teachings of Kaji and Sato would have indicated to a skilled person that the averaging of Sato would provide no speed advantage, in view of the relatively small amount of data required for Kaji's game card identification as compared to the relatively large amount of data in the types of images contemplated by Sato, and would render Kaji less precise.

More specifically, if Sato were to be combined with Kaji, the clearly contrasting black and white pattern, constituting the binary code, of Kaji would be averaged out by the image averaging section 112 of Sato. The code would then result in grayscale colors, constituting noise. Thus, one skilled in the art would have expected this averaging to render it relatively difficult to detect the code. Since the averaging method of Sato would apparently impair Kaji, there would not have been a reasonable expectation of success. Impairment is not success. Thus, it is impermissible, within the framework of § 103, to combine Kaji with Sato in an attempt to achieve Applicant's invention recited in claim 1.[5]

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2. Kaji paragraph 178.

3. Sato col. 1, lines 4-7.

4. Sato col. 4, lines 17-21 and Fig. 2.

5. *Accord* In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984) (finding no suggestion to modify a prior art device where the modification would render the device inoperable

In part 11 of the Office Action, the Examiner appears to suggest that a rejection could be based on Kaji alone, stating "Kaji employs a battery of steps which anticipate or render obvious Applicant's . . . apparatus and method." Applicant respectfully notes, however, that the steps of Kaji are not arranged in a manner that would have suggested Applicant's claim 1. As shown, for example, in Fig. 10 of Kaji, step S15 obtains the approximate position and the approximate angle while step S16 obtain the accurate position and the accurate angle. Although Kaji obtains the approximate position and angle based on the coarse image resolution in mid-flow, Kaji then obtains the accurate position and angle based on the original, non-coarsened, image. In other words, Sobel filtering is applied to extract an outline. Referring to the paragraphs [0193] and [0194] of Kaji, the Sobel filter extracts the outline of the standard marker 114. Then, the extracted standard marker 114 is compared with standard marker pattern data prepared in a database.[6]

Thus, there would have been no motivation to combine Kaji and Sato to suggest claim 1. For this reason alone, there can be no proper rejection under § 103.

Second, even if the combination of Kaji and Sato were permissible under § 103, the resulting combination still would not have suggested Applicant's combination of claim 1, including the interrelation with the recited the first and second structures acting to fix the card in contact with an area having a dimension equal to a dimension of a footprint defined by the card. There would have been no motivation to modify an attempted Kaji-Sato combination to include the first and second structures recited in claim 1 because, for example, Kaji relies on directing a player's formation by changing placement of the player's card (Kaji Abstract). Furthermore, for a person of skill in the art, Kaji's process of Fig. 10, to obtain card angle (relied upon on a part 11 of the office action) would have appeared to make the recited first and second structures, to fix the card in

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for its intended purpose).

6 Under § 103, it is impossible to rearrange Kaji to suggest claim 1. The card data 112 of Kaji is a code consisting of the black and white. If the image resolution is made coarse, information to be designated by the code is missing, and therefore the code becomes more error prone, or nonfunctional.

contact, pointless.

Claim 3 is patentable for the reasons stated above, and further because it recites that the card identifier calculates a distance between the photographic pixel data array and the comparison data array, and obtains the card ID of the entry with the comparison data array at the shortest distance. Paragraph 201 of Kaji would not have suggested the structural elements of claim 3 such as "a distance between the photographic pixel data array and the comparison data array", and "at the shortest distance".

Claim 5 is patentable for the reasons stated above, and further because it recites that the distance is a sum total of squares of differentials between the respective elements of the photographic pixel data array and the corresponding elements of the comparison data array. In paragraph 188 of Kaji, the distance "d" is a distance from the center of the coordinate. That is, the distance "d" is a distance between the center and the dot in the photographed image. In this way, the distance between the pixels in the same image is obtained.

Claim 7 is patentable for the reasons stated above, and further because it recites that the card identifier includes a threshold value determiner for determining whether or not the sum total of differentials is larger than a predetermined threshold value; and excludes any entry with the sum total of differentials larger than the predetermined threshold value from identification candidates. In paragraph 203-213 of Kaji, the luminosity is compared with the threshold value, where the luminosity is not a differential but an absolute value of the pixel.

Claim 8 is patentable for the reasons stated above, and further because it recites that the card identifier includes a number-of-candidates determiner for determining a total number of candidates which are left as a result of determination by the threshold value determiner, and does not obtain any card ID when it is determined by the number-of-candidates determiner that the number of candidates is "0", and obtains the card ID of the identification candidate when it is determined that the number of candidates is "1". Paragraphs 215 and 202 of Kaji disclose the method for decoding the card data consisting of the black and white (binary data). In contrast, in claim 8, a number-of-candidates determiner determines a total number of candidates which are left

as a result of determination by the threshold value determiner. It does not obtain any card ID when it determines the number of candidates is "0", and obtains the card ID of the identification candidate when the number of candidates is "1".

Claim 9 is patentable for the reasons stated above, and further because it recites that the apparatus further comprises a second database including one or more entries, each of the entries including a plurality of candidate card IDs and one determination card ID. In paragraph 388 of Kaji, when the number of candidate coordinates exceeds a predetermined number, the candidate coordinates are culled out by deleting coordinates with a small evaluation value. Then, coordinates with a large evaluation value, which remains after the culling, are made the coordinates of the player card 20. In this way, Kaji determines whether the evaluation value is small or large. In contrast, claim 9 recites the second database. The second database includes one or more entries, each of the entries including a plurality of candidate card IDs and one determination card ID. Thus, Kaji would not have suggested the combination of claim 9, including the recited second database.

Claim 11 is patentable for the reasons stated above, and further because it recites that the apparatus further comprises a cartridge connector, wherein the cartridge connector is equipped with a memory cartridge and the memory cartridge stores another database. In Ishihara, the read data processing circuit 44 and the guide part 461 are mounted on the cartridge 40. In contrast, in claim 11, the cartridge does not have the card reading part. Accordingly, it is relatively easy to add, update and change a database (see lines 11-15 of page 9 of Applicant's Specification translation). If the cartridge has the card reading part, since the cost of the cartridge is higher, the user's decision to purchase the cartridge cannot be taken lightly, and therefore he/she can not update and change the database easily.

Claim 13 is patentable for the reasons stated above, and further because it recites a light source for indirectly irradiating light to a surface to be photographed of the card set in the card photographing part. In Kaji, the card and the light source are positioned opposite to each other; and therefore, the light source is reflected onto the card. In such a case, an image of the light source reflected onto the card may be included in the

photographed image. In contrast, claim 13 recites that the card is indirectly lighted through the reflection. In such manner, the light source is not reflected onto the card and the problem, of the light source image being included in the photographed image, is thus avoided.

Claim 14 is patentable for the reasons stated above, and further because it recites a reflector for diffusely reflecting light from the light source and letting the light enter the surface to be photographed. None of Kaji's paragraph 20, cited by the Examiner, Fig. 5, or any other part of the art record would have suggested this combination of claim 14, including the recited reflector.

Claim 4 is patentable for the reasons stated above, and further because it recites that the distance is a sum total of absolute values of differentials between respective elements of the photographic pixel data array and corresponding elements of the comparison data array. In Shibuya, a sum total of absolute values of SV and CV is calculated. The value SV is the product sum of the sine wave of the fundamental wave Fourier transformation and CV is the product sum of the cosine wave of the fundamental wave Fourier transformation (Shibuya lines 28-31 in paragraph 3). In contrast, in claim 4 a distance is a sum total of absolute values of differentials between respective elements.

Each of claims 12 and 22 is patentable, as it recites, for example, an entertainment apparatus using cards, the apparatus comprising a card identifier for obtaining a data string corresponding to the design from the photographic pixel data array; and wherein the photographic pixel data array former sequentially extracts a predetermined number of pixel data of pixels adjacent to each other in an image represented by the photographic signal from the plurality of pixel data constituting the data array while the extracted pixel data are changed sequentially, and produces the single photographic pixel data based upon the extract predetermined number of pixel data every time the extractor extracts the predetermined number of pixel data is extracted. (Base claim 12).

Each of claims 20 and 24 is patentable, as it recites, for example, a storage medium that is readable by a processor of a card identifying apparatus and stores an identifying program by which a plurality of cards on each of which is visually human-identifiable design is printed can be identified, the identifying program making the

processor execute steps of (d) re-sampling the data array to form a photographic pixel data array; (e) searching the database for a specific comparison data array based on the photographic pixel data array to obtain the card ID pairing up with the specific comparison data array, wherein the step (d) includes (d1) sequentially extracting a predetermined number of pixel data of pixels adjacent to each other in an image represented by the photographic signal from the plurality of pixel data constituting the data array while extracted pixel data are changed sequentially, and (d2) producing the single photographic pixel data based upon the predetermined number of pixel data extracted by the step (d1) every time that the step (d1) is executed. (Base claim 20).

Each of claims 16-19 and 23 is patentable, as it recites, for example, a method of identifying a card by photographing a plurality of cards on each of which a visually human-identifiable design is printed, including steps of (d) re-sampling a data array to form photographic pixel data array; (e) searching the database for a specific comparison data array based on the photographic pixel data array to obtain the card ID pairing up with the specific comparison data array, wherein the step (d) includes (d1) sequentially extracting a predetermined number of pixel data of pixels adjacent to each other in an image represented by the photographic signal from the plurality of pixel data constituting the data array while the extracted pixel data are changed sequentially, and (d2) producing the single photographic pixel data based upon the predetermined number of pixel data extracted by the step (d) every time the step (d1) is executed. No reasonable combination of the art of record, including Shibuya and Kato, would have suggested this method of identifying a card having this interrelation of a searching step with the recited producing of the recited single photographic pixel data. (Base claim 16).

Referring to Fig. 5 of Shimura, the feature calculation unit 2 extracts the features of the illustrative image 20 (step S30). Then, the similarity calculation unit 52 calculates the distance between each of the features of the data base stored in the RAM 8 and the feature of the illustrative image 20 (see FIG. 2). Image data which has the smallest distance value is determined to be most similar to the illustrative image.

But, if Sato is applied to Shimura, the illustrative image loses some features by averaging out. As the result, since the similarity calculation unit 52 of Shimura can not

calculate the similarity, it is not possible to search the desired image. Since Sato thus impairs Shimura, one skilled in the art would not have had a reasonable expectation of success with regard to Shimura as modified by Sato. Impairment is not success and, therefore, it would not have been obvious to combine Shimura with Sato to achieve claim 16.

If the Examiner has any questions about this amendment, Applicant's representative would appreciate discussing this amendment with the Examiner. Applicant's representative, Jerome Jackson, can be reached at 703-684-4840.

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